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Offering Acupuncture as an Adjunct for Tobacco Cessation: A Community Clinic Experience

Emiley Chang, MD¹, Lei-Chun Fung, MSW, MPH², Chin-Shang Li, PhD³, Tzu-Chun Lin, PhD³, Leonard Tam, BS², Carrie Tang, BS², and Elisa K. Tong, MD, MA³

¹University of California, Los Angeles, Los Angeles, CA, USA

²Chinatown Public Health Center, San Francisco, CA, USA

³University of California, Davis, Sacramento, CA, USA

Abstract

Disparities in smoking rates remain prominent within Asian Americans. Medical pluralism and cultural tailoring may enhance Asian Americans engaging with tobacco cessation assistance. We conducted a retrospective analysis of a community clinic's smoking cessation program targeting a Chinese population that offered acupuncture, nicotine replacement therapy (NRT), and counseling from 2007 to 2010. Most participants used acupuncture, with about half choosing acupuncture and NRT, followed by more than 40% choosing acupuncture only; few chose NRT only. Tobacco cessation rates at 6 months were relatively high for the acupuncture + NRT group and only acupuncture group (37.7% vs. 28.9%). In comparing tobacco reduction >50% from baseline with an expanded only NRT group, the acupuncture + NRT group had a higher odds ratio than the only acupuncture group, which had a lower odds ratio. Our evaluation of this real-world community program offering acupuncture as a cultural adjunct to a tobacco cessation program suggests that acupuncture might help with engagement by Chinese American male smokers into a tobacco cessation program that offers counseling and NRT. Future larger studies should further evaluate the efficacy of offering acupuncture in combination with NRT on the outcomes of cessation and reduction.

Keywords

cessation; tobacco prevention and control; Asian; minority health; community intervention; outcome evaluation; program planning and evaluation

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Address correspondence to: Elisa K. Tong, MD, MA, Department of General Internal Medicine, University of California, Davis, 4150 V Street, Suite 2400, Sacramento, CA 95817, USA; elisa.tong@ucdmc.ucdavis.edu.

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INTRODUCTION

Following concerted efforts to change social norms, legislation, and health policy, U.S. smoking rates have declined in the past half century from more than 40% to 19% by 2010 (Schiller, Lucas, Ward, & Peregoy, 2012). In California, smoking rates reached a historic low of 11.9% in 2010, achieving the federal Healthy People 2020 target of 12% (California Department of Public Health, California Tobacco Control Program, 2011). Unfortunately, disparities with high male smoking rates remain prominent for Asian Americans (Chae, Gavin, & Takeuchi, 2006; Tong, Nguyen, Vittinghoff, & Pérez-Stable, 2009). This disparity is in part because of the fact that tobacco control lags in the Asia Pacific region, where a third of the world's smokers reside (World Health Organization, Western Pacific Region, 2011) and immigrants may continue their smoking behavior. Another factor is that the tobacco industry has also targeted Asian American and Pacific Islander communities through advertising, promotions, and sponsorship (Muggli, Pollay, Lew, & Joseph, 2002). Also, although tobacco treatment guidelines recommend counseling and pharmacotherapy as the standard of care (Fiore et al., 2009), Asian American smokers report receiving provider advice (Tong, Tang, Chen, & McPhee, 2011) or using pharmacotherapy at lower rates than the general population (Carr, Beers, Kassebaum, & Chen, 2005).

The acceptability of Asian Americans engaging with tobacco cessation assistance could be enhanced with greater cultural considerations. A Western-based health care system that acknowledges and embraces medical pluralism—which refers to the way multiple types of treatment systems can be accessed simultaneously or in sequence to address health problems, but not necessarily in an integrated fashion—can enhance the cultural appropriateness of health care, since many Asian immigrants access both medical systems simultaneously (Green, Bradby, Chan, & Lee, 2006). Furthermore, “cultural tailoring” is another means by which health education can be modified to reflect different styles of communication common in various racial/ethnic groups, including health beliefs, norms, values, and common cultural experiences, and has been used previously to enhance tobacco cessation programs for minority youth (Kong, Singh, & Krishnan-Sarin, 2012).

To explore the feasibility and acceptability of incorporating medical pluralism and cultural tailoring, our study is a retrospective analysis of a 3-year community-based smoking cessation program that offered acupuncture as an adjunct to counseling and nicotine replacement therapy (NRT). The intervention was initiated and conducted by a well-established San Francisco community clinic based in Chinatown, which primarily serves a Chinese immigrant population. Our primary goals were to (a) analyze demographic and tobacco-related characteristics associated with smokers who use acupuncture as an adjunct to standard counseling and NRT and (b) explore how acupuncture utilization is associated with tobacco cessation in a retrospective analysis of a real-world community program.

BACKGROUND

China is the largest tobacco consumer in the world, representing one quarter of all smokers; over half of the male population is actively smoking (Li, Hsia, & Yang, 2011). Smoking cessation assistance, however, is limited in China, which has a dual system of Western and

traditional Chinese (or Eastern) medicine, the latter of which has a holistic view of the body as an interconnected system and treatments focus on restoring balance. Physicians in China report little use of offering pharmacotherapy (7%) or using acupuncture or herbs (16%); these low rates may be due to the high acceptability and social norm of smoking (Jiang et al., 2007).

In California, current Chinese male smokers are disproportionately immigrants, with the highest smoking prevalence rates among Cantonese-speaking men (21.7%; Carr et al., 2005). Likewise, few Chinese American smokers use any assistance with tobacco cessation. Among Chinese American smokers in California, 86.3% attempted to quit on their own (Carr et al., 2005). Of the smokers using assistance, 25.2% tried a “Western medical technique” (such as nicotine patches or gum), 15% consulted a health professional, and 1.1% tried an “Eastern medical technique.” Interestingly, when former smokers helped a family member or friend quit (8.9% of former smokers), only 14.5% used a “Western medical technique,” whereas 7.7% used an “Eastern medical technique.” Overall, these low rates of assistance may be because of a combination of factors including access to resources, attitudes and knowledge toward assistance, and limited application of Eastern medicine to cessation.

Acupuncture is a traditional Chinese therapy where practitioners place thin needles at specific points on the body to correct disturbances in the flow of energy, or *qi*, and restore health. According to complementary and alternative medicine (CAM) data from the California Health Interview Survey (CHIS-CAM), nearly three quarters of Asian Americans used at least one type of CAM in the past 12 months and 16% had received acupuncture (Hsiao et al., 2006). Use is not limited to East Asians. South Asians, for example, have a form of acupuncture called *suchi-karma* in Ayurvedic medicine. Acupuncture use has also been reported by U.S. Cambodian refugees for mental health issues (Berthold et al., 2007)

Best known for its analgesic effects, acupuncture has also been investigated to reduce nicotine craving and withdrawal symptoms, based on an incidental observation in a 1973 journal article that Hong Kong opium smokers reported less severe withdrawal symptoms with electro acupuncture (Wen & Cheung, 1973). A recent randomized, single-blind, sham-controlled study of 48 patients also showed that acupuncture can be a successful adjunct to preventing relapse in opioid detoxification with buprenorphine and naloxone (Meade et al., 2010). In a 2003 review of clinical trials on acupuncture, the World Health Organization (2003) listed tobacco dependence as one of the disorders for which acupuncture may have a therapeutic effect based on available studies but required further evidence. Unfortunately, it is very difficult to study with the gold standard of randomized trials. A 2011 Cochrane review on acupuncture and tobacco cessation was inconclusive, citing methodological issues with the use of sham acupuncture in randomized controlled trials, which may release therapeutic endorphins, as well as disproportionate effects of positive studies (White, Rampes, Liu, Stead, & Campbell, 2011). Because of the indeterminate body of evidence, acupuncture has not been offered to our knowledge on a consistent basis within a real-world tobacco cessation program.

METHOD

Recruitment

An initial 169 participants were recruited for the tobacco cessation program offering acupuncture, NRT, and counseling between July 2007 and April 2010 by health educators at a San Francisco public health clinic. Health educators performed chart reviews before each clinic to identify current smokers and provided in-service trainings to facilitate in-clinic referrals. The program was also advertised via local Chinese media, other community clinics, and health fairs. Following the completion of the acupuncture and smoking cessation project, which was funded by the city of San Francisco Department of Public Health's tobacco control program, an additional 55 community members participated in smoking cessation counseling that did not offer acupuncture between July 2010 and June 2011. As the data set provided by the community clinic had been de-identified, an exemption was obtained from the University of California, Davis Institutional Review Board for the purpose of analysis.

Intervention

The intervention consisted of one individual office counseling session, and two group class sessions with options offered for acupuncture treatments and NRT. We therefore categorized the self-selected treatment groups as (a) *only acupuncture*, (b) *only NRT*, and (c) *acupuncture + NRT*. The individual counseling, including in the group class sessions, was conducted by the bilingual, bicultural health education staff. Acupuncture was provided by a Chinese physician with medical acupuncturist training and a licensed acupuncturist. Up to six needles were used in each area, most commonly elbows, knees, and earlobes. For participants who declined acupuncture therapy or were waiting for needle placement, counselors helped them set up a quit plan and strategies for reduction and cessation. All needles were in place within the first 30 minutes; those who received acupuncture first had therapy the longest, but all had therapy for at least 15 minutes. Prescriptions for nicotine patches were offered, and patients were responsible for picking up the medications from their pharmacies. Medication costs were covered by Medi-Cal or the county insurance, which also has a program that provides coverage to uninsured residents. Acupuncture was provided free of charge.

Evaluation and Outcomes

Baseline participant information was obtained from the intake survey at the individual counseling session. Sociodemographic variables included age, gender, and race/ethnicity. Tobacco-related history included mean cigarettes per day at baseline, mean years of smoking, time to first cigarette after waking (categorized as <30 minutes or >30 minutes), and stage of change at initial evaluation—*contemplative* (“thinking about quitting”), *preparation* (“want to quit in next 6 months”), and *action* (“want to quit within the next month”). Participants were also asked whether they had used acupuncture for tobacco cessation before. Follow-up telephone surveys were conducted at 1-week, 1-month, 3-month, and 6-month intervals to assess for cessation rates. The primary tobacco cessation outcome was point prevalence of current smoking. A secondary outcome was reduction of 50% cigarettes per day from baseline.

Given the small number of participants choosing *only NRT* in the original cohort and high loss to follow-up, we incorporated data for analyzing cessation and reduction outcomes from the 55 additional participants in the 2010–2011 tobacco counseling program, when acupuncture was no longer offered. The majority of these additional participants opted to use NRT over counseling alone, increasing the *only NRT* group from 13 to an *expanded only NRT* group of 54 participants. These analyses thus included 210 participants.

Statistical Analysis

Among the three treatment groups, we compared the distribution of categorical variables using Fisher's exact test and numerical or ordinal categorical variables using the Kruskal–Wallis test. When only two treatment groups were compared (*only NRT*, *acupuncture + NRT*), we used the Fisher's exact test for comparing the distribution of categorical variables and the two-sided Wilcoxon rank-sum test for comparing a numerical variable or an ordinal categorical variable.

Univariable logistic regression was used to study each factor associated with the binary outcome of interest, while comparing the proportion of binary outcome with “yes” response among the three treatment groups. We also performed exploratory multivariable logistic regression analyses by incorporating independent variables via the stepwise selection procedure with the criterion of significance level (<0.25) for entering independent variables and significance level (>0.3) for removing independent variables and keeping the group independent variable, treatment group, in the multivariable logistic regression model to study factors associated with the binary outcome. For the two treatment group comparison, the above procedure was similarly applied. A p value $<.05$ was considered statistically significant. All analyses were performed with SAS v9.2 (SAS Institute Inc., Cary, NC).

RESULTS

Of the 169 participants enrolled in the tobacco cessation program offering acupuncture, the majority (52%) combined acupuncture with NRT; 68 (41%) chose to incorporate acupuncture only; and 13 (7.7%) participants chose to use NRT only. The average participant was older than 50 years (64%), Chinese American (83%), and male (89%); demographics were similar between the original and expanded *only NRT* cohorts. At baseline, participants smoked an average of 16 cigarettes per day, and the average stage of change was 2.8 (between *contemplation* and *preparation*). Only 27 of the original 169 participants (16%) indicated prior experience with acupuncture specifically for cessation; the additional *expanded only NRT* participants had not been asked about prior acupuncture experience, as acupuncture was not being offered at that time.

Characteristics of Three Treatment Groups

Table 1 demonstrates that among the original participants, there were significantly fewer counseling contacts with *only NRT* participants (averaging 1.4 out of possible 3) compared with *only acupuncture* (1.7) and *acupuncture + NRT* (1.8). In the *expanded only NRT* group, the average number of contacts was increased at 2.5. Otherwise, there were no statistical differences found in choice of treatment group by age, gender, race/ethnicity (non-Chinese

vs. Chinese), years of smoking, time to first cigarette after waking, baseline stage of change, or baseline number of cigarettes smoked per day; this remained unchanged with the *expanded only NRT* group.

Comparing Tobacco Outcomes for the Three Treatment Groups

For tobacco cessation rates, the bivariate analysis between the three treatment groups with 6-month quit rates of 38% in the *acupuncture + NRT* group and 29% in the *only acupuncture* group but none in the *only NRT* group. After including the *expanded only NRT* group Table 2 demonstrates that quit rates were generally higher in the two groups using any NRT at all follow-up intervals. However, no statistically significant difference was found in cessation rates between the three treatment groups beyond the first week.

Using multivariate logistic regression, there were no statistically significant differences for tobacco cessation between the three groups at all time points (data not shown).

For tobacco reduction 50% from baseline, the multivariate logistic regression analysis (not shown) showed a statistically significant difference at 1 month for *acupuncture + NRT* compared with the *only acupuncture* group (odds ratio [OR] = 6.76, 95% confidence interval [CI] = 2.51–18.2), with a trend toward significance for the *only NRT* group (OR = 1.52, 95% CI = 0.248–9.33); no further analyses were conducted after the 1-month follow-up because of the high loss to follow-up. Using the *expanded only NRT* group as a comparison, Table 3 demonstrates statistically significant differences for 50% reduction from baseline with *acupuncture + NRT* having higher point estimates and *only acupuncture* having lower point estimates over the follow-up period between 1 week and 6 months. However, after Week 1, all the confidence intervals of the odds ratios crossed 1.0 making the statistical significance less clear.

DISCUSSION

In this community clinic's tobacco cessation program with a mostly Chinese male smoker population, offering acupuncture resulted in more than 90% of participants choosing to use acupuncture, and more than half of these participants also used NRT. Even if participants chose acupuncture only, which has inconclusive evidence to date for tobacco cessation assistance, engaging in a tobacco cessation program with counseling may double the smoker's chances of quitting. Since there were no cost barriers for either acupuncture or NRT, this is a more accurate reflection of smoker preference. The acceptability was high for acupuncture within a tobacco cessation program, despite few participants reporting prior experience with acupuncture specifically for cessation. As mentioned previously, California Chinese smokers reported low utilization rates of any smoking cessation assistance (13.7%) in their quit attempts (Carr et al., 2005). Furthermore, California Asian American smokers report low proportions of provider advice to quit in the past year, largely because only half of these smokers saw a provider (Tong et al., 2011). Our evaluation suggests that offering acupuncture as an adjunct may be useful in engaging Chinese smokers to enroll in a tobacco cessation program.

Our cessation outcome rates at 6 months were similar to other literature reports. A Cochrane review of randomized controlled trials cited smoking cessation rates of 16% to 24% with various forms of NRT at 6 months, compared with 8% to 12% with placebo (Stead et al., 2012). Tobacco cessation rates at 6 months exceeded these averages in our evaluation of this community program, and even with a more stringent intention-to-treat analysis (where lost-to-follow-up is considered as a continued smoker) the cessation rates are consistent with the NRT literature (only acupuncture 19%, NRT with or without acupuncture 26% to 27%). While the frequency of counseling sessions was not intensive, unlike the randomized controlled trials of NRT (Stead et al., 2012), it is possible that the culturally and linguistically tailored counseling contributed significantly to the outcomes. A future study should consider including an “only counseling” group to examine its effect.

Intriguingly, tobacco reduction 50% from baseline generally favored the *acupuncture + NRT* group compared with the *expanded only NRT* group, whereas the *only acupuncture* group fared worse. This would suggest a potential synergistic effect for acupuncture with NRT in reducing consumption, presumably from decreasing cravings. Since the confidence intervals slightly crossed 1.0 in some of the multivariate analyses, a larger sample size may help definitively demonstrate statistical significance.

Limitations of this study include use of a convenience sample, lack of blinding, modest sample size, lack of confirmation that NRT was taken and not just prescribed, and variable acupuncture time and locations used as well as limited number of treatments. This was not a randomized controlled trial using sham acupuncture, but rather an evaluation of a real-world community program; future study could consider these factors in a randomized trial. Future study should confirm tobacco cessation with biochemical validation, which might be particularly important for female Asian smokers (Jung-Choi, Khang, & Cho, 2012).

As the majority of participants in our study were of Chinese ethnicity, we were not able to generalize findings to other racial/ethnic groups, but offering acupuncture may hold promise for the general population. In our study, we found high acceptability of acupuncture among non-Chinese participants with only 3 out of 31 (10%) declining acupuncture and over half opting to use only acupuncture. In California, other racial/ethnic groups have indeed used acupuncture in the past year, besides 16% of Asian Americans: 12% non-Latino Whites, 11% American Indians, 9% African Americans, and 4% Latinos (Hsiao et al., 2006).

Offering acupuncture as an adjunct to tobacco cessation counseling may increase outreach to smokers in priority populations who may not be accessing traditional medical services. As mentioned previously, few Chinese American smokers access conventional medical care for tobacco cessation including seeing a provider. Questions have been raised whether cessation counseling is effective for recent Asian immigrants, who may not be familiar with the practice of “talk therapy” (Chen & Tang, 2007). However, a recent randomized study showed that among limited English-speaking Chinese, Korean, and Vietnamese immigrants calling into the California Smokers’ Helpline, using a single culturally tailored counseling protocol for Asian Americans doubled self-reported quit rates compared with provision of culturally tailored and linguistically appropriate self-help materials alone (Zhu et al., 2012).

Since quitlines also refer smokers to local resources, this could be an important channel for increasing awareness of acupuncture resources.

In our program, acupuncture was offered free of charge, and participants had NRT covered by insurance; this may have contributed to high acceptance rates of both by decreasing barriers for assistance. A Minnesota state quitline program found increased participation and abstinence rates once free NRT was offered (An et al., 2006). The low numbers of participants indicating prior experience with acupuncture for tobacco cessation was not surprising, given that it is more commonly accessed for chronic pain not addressed by Western medicine, musculoskeletal issues, and general health maintenance (Burke, Upchurch, Dye, & Chyu, 2006). For patients with insurance, limited acupuncture benefits are commonly offered for conditions such as chronic pain and chemotherapy-related side effects; acupuncture as an adjunct to tobacco cessation could be another indication that could be covered, rapidly scaling dissemination and availability of this promising potential therapy.

CONCLUSION

Our evaluation of this real-world community health education program at the very least suggests that offering free acupuncture may help Chinese male smokers engage in a tobacco cessation program of counseling and NRT. The vast majority of participants used acupuncture for tobacco cessation when offered, often without prior experience for this indication, suggesting high cultural acceptability in our primarily Chinese population that may exceed acceptability of even NRT. Without this level of cultural engagement, the smokers may not have had the opportunity or encouragement to consider NRT. Despite methodological issues inherent in randomized controlled trials of acupuncture, it is worthwhile to continue “real-world” investigations of offering acupuncture, which is generally safe, and can be tried in patients who have contraindications to using NRT or other pharmacological aides to tobacco cessation. Our study provides intriguing suggestions of a synergistic effect with acupuncture and NRT for reducing consumption, warranting further exploration whether acupuncture can be used as an adjunct therapy for control of withdrawal symptoms or nicotine craving. Future larger studies examining cessation should consider including a group that evaluates a counseling arm to determine the relative effect of adding NRT or acupuncture.

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TABLE 1

Demographic Information and Tobacco History for Smoking Cessation Program Offering Acupuncture (2007–2010).

	Only NRT	Only Acupuncture	Acupuncture + NRT	P
Total	13	68	88	
Age (years)				
18–34	2	5	8	.677
35–50	2	21	22	
51–64	7	30	35	
65	2	12	23	
Gender				
Female	3	9	8	.259
Male	10	59	80	
Race/ethnicity				
Chinese	10	52	75	.262
Non-Chinese	3	16	12	
Other API	0	2	5	
Caucasian	1	11	0	
Latino	1	2	4	
African American	1	1	3	
Mean years of smoking	31.77	30.77	33.91	.436
Time to first cigarette after waking				
<30 minutes	7	59	65	.799
>30 minutes	4	9	21	
Stage of change at baseline				
Contemplative	7	22	40	.152
Preparation	0	16	23	
Action	6	18	23	
Mean cigarettes per day at baseline	15.4	15.4	16.5	.313
Used acupuncture for cessation before				
Yes	5	12	10	.048
No	8	56	75	
Mean number of program contacts	1.38	1.68	1.81	.018

NOTE: NRT = nicotine replacement therapy; API = Asian/Pacific Islander.

TABLE 2

Bivariate Analysis of Tobacco Cessation in the Three Treatment Groups, With Expanded “Only NRT” Group (2007–2011).

	Only NRT (<i>n</i> = 54)	Only Acupuncture (<i>n</i> = 68)	Acupuncture + NRT (<i>n</i> = 88)	P
1 Week	19 (35.9%)	11 (17.5%)	21 (24.4%)	.016
1 Month	15 (35.7%)	14 (23.3%)	19 (23.2%)	.291
3 Months	12 (32.4%)	12 (23.1%)	21 (27.6%)	.798
6 Months	15 (38.5%)	13 (28.9%)	23 (37.7%)	.767

NOTE: NRT = nicotine replacement therapy.

TABLE 3

Multivariate Logistic Regression Analysis of 50% Reduction of Cigarettes per Day From Baseline, Compared With Expanded “Only NRT” Group (2007–2011).

	Acupuncture Only; OR [95% CI]	Acupuncture + NRT; OR [95% CI]	P
1 Week	0.354 [0.146–0.858]	0.937 [0.405–2.17]	.022
1 Month	0.449 [0.173–1.16]	2.810 [1.00–7.85]	.001
3 Months	0.355 [0.122–1.03]	1.160 [0.401–3.34]	.035
6 Months	0.569 [0.16–2.02]	3.620 [0.943–13.9]	.002

NOTE: OR = odds ratio; CI = confidence interval; NRT = nicotine replacement therapy.